Turkey ranks 49th among the 129 economies featured in the GII 2019.

The Global Innovation Index (GII) is a ranking of world economies based on innovation capabilities. Consisting of roughly 80 indicators, grouped into innovation inputs and outputs, the GII aims to capture the multi-dimensional facets of innovation.

The following table shows the rankings of Turkey over the past three years, noting that data availability and the GII model influence year-on-year comparisons of the GII ranks. The confidence interval for Turkey’s ranking in the GII 2019 is between 45 and 51.

<table>
<thead>
<tr>
<th></th>
<th>GII</th>
<th>Innovation Inputs</th>
<th>Innovation Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>49</td>
<td>56</td>
<td>49</td>
</tr>
<tr>
<td>2018</td>
<td>50</td>
<td>62</td>
<td>43</td>
</tr>
<tr>
<td>2017</td>
<td>43</td>
<td>68</td>
<td>36</td>
</tr>
</tbody>
</table>

- Turkey performs better in Innovation Outputs than Inputs.
- This year Turkey ranks 56th in Innovation Inputs, better than last year and compared to 2017.
- As for Innovation Outputs, Turkey ranks 49th. This position is worse than last year and compared to 2017.

Turkey ranks 7th among the 34 upper middle-income economies.

Turkey ranks 5th among the 19 economies in Northern Africa and Western Asia.
The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected and those below are considered Innovation under-performers relative to GDP.

Relative to GDP, Turkey performs below its expected level of development.

GII scores and GDP per capita in PPP US$ (bubbles sized by population)
EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

The chart below shows the relationship between innovation inputs and innovation outputs, indicating which economies best translate innovation inputs into innovation outputs. Economies appearing above the line are effectively translating their costly innovation investments into more and higher-quality outputs. In contrast, those below the line are not effectively translating innovation inputs into outputs.

Turkey produces more innovation outputs relative to its level of innovation investments.

Innovation input/output performance by income group, 2019
BENCHMARKING TURKEY TO OTHER UPPER MIDDLE-INCOME ECONOMIES AND THE NORTHERN AFRICA AND WESTERN ASIA REGION

Turkey’s scores in the seven GII pillars

Upper middle-income economies

Turkey has high scores in 5 out of the 7 GII pillars: Human capital & research, Infrastructure, Market sophistication, Knowledge & technology outputs, and Creative outputs, which are above the average of the upper middle-income group.

Northern Africa and Western Asia Region

Compared to other economies in Northern Africa and Western Asia, Turkey performs above average in 6 out of the 7 GII pillars: Human capital & research, Infrastructure, Market sophistication, Business sophistication, Knowledge & technology outputs, and Creative outputs.

Top ranks are found in areas such as Research and development (R&D), General infrastructure, Trade, competition, & market scale, Knowledge creation, and Intangible assets where the country ranks in the top 40 worldwide.
OVERVIEW OF TURKEY’S RANKINGS IN THE 7 GII AREAS

Turkey performs the best in Creative outputs and its weakest performance is in Institutions.

*The highest possible ranking in each pillar is 1.

TURKEY’S INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of Turkey’s strengths and weaknesses in the GII 2019.

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Code</th>
<th>Indicator name</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1.3</td>
<td>2.1.3</td>
<td>School life expectancy, years</td>
<td>14</td>
</tr>
<tr>
<td>2.2.1</td>
<td>2.2.1</td>
<td>Tertiary enrolment, % gross</td>
<td>3</td>
</tr>
<tr>
<td>3.2.3</td>
<td>3.2.3</td>
<td>Gross capital formation, % GDP</td>
<td>20</td>
</tr>
<tr>
<td>3.3.1</td>
<td>3.3.1</td>
<td>GDP/unit of energy use</td>
<td>19</td>
</tr>
<tr>
<td>4.3</td>
<td>4.3</td>
<td>Trade, competition, &amp; market scale</td>
<td>15</td>
</tr>
<tr>
<td>4.3.2</td>
<td>4.3.2</td>
<td>Intensity of local competition†</td>
<td>6</td>
</tr>
<tr>
<td>4.3.3</td>
<td>4.3.3</td>
<td>Domestic market scale, bn PPP$</td>
<td>13</td>
</tr>
<tr>
<td>6.2.3</td>
<td>6.2.3</td>
<td>Computer software spending, % GDP</td>
<td>20</td>
</tr>
<tr>
<td>7.1</td>
<td>7.1</td>
<td>Intangible assets</td>
<td>20</td>
</tr>
<tr>
<td>7.1.1</td>
<td>7.1.1</td>
<td>Trademarks by origin/bn PPP$ GDP</td>
<td>13</td>
</tr>
<tr>
<td>7.1.2</td>
<td>7.1.2</td>
<td>Industrial designs by origin/bn PPP$ GDP</td>
<td>1</td>
</tr>
<tr>
<td>7.2.5</td>
<td>7.2.5</td>
<td>Creative goods exports, % total trade</td>
<td>21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weaknesses</th>
<th>Code</th>
<th>Indicator name</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>1.2</td>
<td>Regulatory environment</td>
<td>102</td>
</tr>
<tr>
<td>1.2.3</td>
<td>1.2.3</td>
<td>Cost of redundancy dismissal, salary weeks</td>
<td>115</td>
</tr>
<tr>
<td>2.1.2</td>
<td>2.1.2</td>
<td>Government funding/pupil, secondary, % GDP/cap</td>
<td>90</td>
</tr>
<tr>
<td>4.1.3</td>
<td>4.1.3</td>
<td>Microfinance gross loans, % GDP</td>
<td>78</td>
</tr>
<tr>
<td>4.2.2</td>
<td>4.2.2</td>
<td>Market capitalization, % GDP</td>
<td>56</td>
</tr>
<tr>
<td>4.2.3</td>
<td>4.2.3</td>
<td>Venture capital deals/bn PPP$ GDP</td>
<td>78</td>
</tr>
<tr>
<td>5.2.4</td>
<td>5.2.4</td>
<td>JV–strategic alliance deals/bn PPP$ GDP</td>
<td>95</td>
</tr>
<tr>
<td>5.3.3</td>
<td>5.3.3</td>
<td>ICT services imports, % total trade</td>
<td>124</td>
</tr>
<tr>
<td>6.3</td>
<td>6.3</td>
<td>Knowledge diffusion</td>
<td>112</td>
</tr>
<tr>
<td>6.3.1</td>
<td>6.3.1</td>
<td>Intellectual property receipts, % total trade</td>
<td>96</td>
</tr>
<tr>
<td>6.3.3</td>
<td>6.3.3</td>
<td>ICT services exports, % total trade</td>
<td>122</td>
</tr>
<tr>
<td>7.1.4</td>
<td>7.1.4</td>
<td>ICTs &amp; organizational model creation†</td>
<td>98</td>
</tr>
</tbody>
</table>
STRENGTHS

- GII strengths for Turkey are found in five of the seven GII pillars.
- In Human capital & research (46), Turkey exhibits strengths in indicators School life expectancy (14) and Tertiary enrolment (3).
- In Infrastructure (41), Turkey’s strengths are indicators Gross capital formation (20) and GDP per unit of energy use (19).
- In Market sophistication (52), GII strengths for this country are sub-pillar Trade, competition, & market scale (15) and two of its three indicators - Intensity of local competition (6) and Domestic market scale (13).
- In Knowledge & technology outputs (59), indicator Computer software spending (20) is a relative strength of Turkey.
- In Creative outputs (40), Turkey’s strengths are sub-pillar Intangible assets (20) and indicators Trademarks by origin (13), Creative goods exports (21), and Industrial designs by origin, where Turkey ranks 1st worldwide.

WEAKNESSES

- Turkey’s weaknesses in the GII are found in six of the seven GII pillars.
- In Institutions (85), Turkey exhibits weaknesses in sub-pillar Regulatory environment (102) and in indicator Cost of redundancy dismissal (115).
- In Human capital & research (46), a single weakness is found in indicator Government funding per pupil (90).
- In Market sophistication (52), Turkey’s relative weaknesses are indicators Microfinance gross loans (78), Market capitalization (56), and Venture capital deals (78).
- In Business sophistication (71), relative weaknesses for this country are indicators Joint Ventures - strategic alliance deals (95) and ICT services imports (124).
- In Knowledge & technology outputs (59), sub-pillar Knowledge diffusion (112) and indicators Intellectual property receipts (96) and ICT services exports (122) are GII weaknesses of Turkey.
- In Creative outputs (40), only one indicator – ICTs & organizational model creation (98) – is a relative weakness for the country.
<table>
<thead>
<tr>
<th>Output rank</th>
<th>Input rank</th>
<th>Income</th>
<th>Region</th>
<th>Population (mn)</th>
<th>GDP, PPP$</th>
<th>GDP per capita, PPP$</th>
<th>Gil 2018 rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>56</td>
<td>Upper middle</td>
<td>NAWA</td>
<td>81.9</td>
<td>2,314.4</td>
<td>27,956.1</td>
<td>50</td>
</tr>
</tbody>
</table>

### INSTITUTIONS

<table>
<thead>
<tr>
<th>Score/Value Rank</th>
<th>Political environment</th>
<th>Education</th>
<th>Tertiary education</th>
<th>Research &amp; development (R&amp;D)</th>
<th>Tertiary infrastructure</th>
<th>Ecological sustainability</th>
<th>Information &amp; communication technologies (ICTs)</th>
<th>Infrastructure</th>
<th>Market sophistication</th>
<th>Business sophistication</th>
</tr>
</thead>
<tbody>
<tr>
<td>57.4 85</td>
<td>53.8 69</td>
<td>44.0 73</td>
<td>37.3 43</td>
<td>27.7 39</td>
<td>40.4 52</td>
<td>69 73</td>
<td>73 49</td>
<td>52.2 41</td>
<td>50.8 52</td>
<td>29.5 71</td>
</tr>
</tbody>
</table>

#### 1.1 Political environment
- Political and operational stability
- Government effectiveness
- Rule of law
- Cost of redundancy dismissal, salary weeks

#### 2.1 Education
- Expenditure on education, % GDP
- Government funding/pupil, secondary, % GDP/cap
- School life expectancy, years
- PSA scales in reading, maths, & science
- Pupil-teacher ratio, secondary

#### 2.2 Tertiary education
- Expenditure on R&D, % GDP
- Graduates in science & engineering, %
- Tertiary inbound mobility

#### 2.3 Research & development (R&D)
- Researchers, FTE/mn pop
- Gross expenditure on R&D, % GDP
- Global R&D companies, avg. exp. top 3 mn US$
- QS university ranking, average score top 3

#### 3.1 Information & communication communication technologies (ICTs)
- ICT access
- ICT use
- Government’s online service
- E-participation

#### 3.2 General infrastructure
- Electrical output, kWh/m pop
- Logistics performance
- Gross capital formation, % GDP

#### 3.3 Ecological sustainability
- GDP/Unit of energy use
- Environmental performance
- ISO 14001 environmental certificates/bn PPP$ GDP

### BUSINESS SOPHISTICATION

<table>
<thead>
<tr>
<th>Score/Value Rank</th>
<th>Knowledge workers</th>
<th>Knowledge creation</th>
<th>Knowledge impact</th>
<th>Knowledge diffusion</th>
<th>Intangible assets</th>
<th>Creative goods &amp; services</th>
<th>Online creativity</th>
</tr>
</thead>
<tbody>
<tr>
<td>57.4 85</td>
<td>34.6 72</td>
<td>22.2 38</td>
<td>38.1 57</td>
<td>8.8 112</td>
<td>55.1 20</td>
<td>17.8 60</td>
<td>8.9 55</td>
</tr>
</tbody>
</table>

#### 5.1 Knowledge workers
- Firms offering formal training, % firms
- GERD performed by business, % GDP
- Females employed w/advanced degrees, %

#### 5.2 Innovation linkages
- University/industry research collaboration
- State of cluster development
- GERD financed by abroad, %

#### 5.3 Knowledge absorption
- Intellectual property payments, % total trade
- High-tech imports, % total trade
- ICT services imports, % total trade
- Firms offering formal training, % firms

#### 7.1 Intangible assets
- Trademarks by origin/bn PPP$ GDP
- GERD financed by business, %
- Knowledge creation
- Knowledge impact

#### 7.2 Creative goods & services
- Creative goods & services exports, % total trade
- National feature films/mn pop
- Entertainment & Media market/t pop
- Printing & other media, % manufacturing
- Creative goods exports, % total trade

#### 7.3 Online creativity
- Generic top-level domains (TLDs)/t pop
- Country-code TLDs/t pop
- Wikipedia edits/mn pop
- Mobile app creation/bn PPP$ GDP

**NOTES:** ○ indicates a strength; ◆ a weakness; ● an income group strength; ◇ an income group weakness; * an index; † a survey question. ○ indicates that the economy's data are older than the base year; see Appendix II for details, including the year of the data, at http://globalinnovationindex.org. Square brackets [ ] indicate that the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level.
Turkey has complete data coverage in the GII 2019.

The following table lists data that are outdated for Turkey.

### Outdated data

<table>
<thead>
<tr>
<th>Code</th>
<th>Indicator name</th>
<th>Country year</th>
<th>Model year</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1.5</td>
<td>Pupil-teacher ratio, secondary</td>
<td>2015</td>
<td>2017</td>
<td>UNESCO Institute for Statistics</td>
</tr>
<tr>
<td>2.2.1</td>
<td>Tertiary enrolment, % gross</td>
<td>2016</td>
<td>2017</td>
<td>UNESCO Institute for Statistics</td>
</tr>
<tr>
<td>2.2.2</td>
<td>Graduates in science &amp; engineering, %</td>
<td>2014</td>
<td>2016</td>
<td>UNESCO Institute for Statistics</td>
</tr>
<tr>
<td>4.1.3</td>
<td>Microfinance gross loans, % GDP</td>
<td>2015</td>
<td>2017</td>
<td>Microfinance Information Exchange</td>
</tr>
</tbody>
</table>
ABOUT THE GLOBAL INNOVATION INDEX

The Global Innovation Index (GII) is co-published by Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations. In 2019, the GII presents its 12th edition devoted to the theme Creating Healthy Lives—The Future of Medical Innovation.

Recognizing that innovation is a key driver of economic development, the GII aims to provide a rich innovation ranking and analysis referencing around 130 economies. Over the last decade, the GII has established itself as both a leading reference on innovation and a “tool for action” for countries that incorporate the GII into their innovation agendas.

The Index is a ranking of the innovation capabilities and results of world economies. It measures innovation based on criteria that includes institutions, human capital and research, infrastructure, credit, investment, linkages; the creation, absorption and diffusion of knowledge; and creative outputs.

The GII has two sub-indices: the Innovation Input Sub-Index and the Innovation Output Sub-Index, and seven pillars, each containing three sub-pillars.